



## Activity 5

# Acting on Information About Cancer

**Focus:** Students assume the roles of federal legislators to identify reasons to support or oppose a proposed statute that would require individuals under the age of 18 to wear protective clothing when outdoors.

**Major Concepts:** We can use our understanding of the science of cancer to improve personal and public health. Translating our understanding of science into public policy can raise a variety of issues, such as the degree to which society should govern the health practices of individuals. Such issues often involve a tension between the values of preserving personal and public health and preserving individual freedom and autonomy.

**Objectives:** After completing this activity, students will

- understand that science can help us improve personal and public health,
- be able to explain that good choices can reduce an individual's risk of developing cancer and can improve an individual's chance of survival if he or she does develop it,
- understand that ethics brings to public policy debates two presumptions: that we should protect individual autonomy and that we should protect individual and societal health and well-being,
- recognize that ethical values sometimes conflict in public policy debates about strategies for reducing the risk of cancer, and
- understand that it is possible for people to hold different positions on a controversial topic and still participate in a reasoned discussion about it.

**Prerequisite Knowledge:** Students should understand that cancer is a disease involving uncontrolled cell division that results from mutations in genes that regulate the cell cycle. They also should understand that the genetic damage that leads to cancer accumulates across time and that exposure to agents that damage DNA can increase an individual's risk of developing cancer.

**Basic Science-Public Health Connection:** This activity helps students recognize that the results of scientific research can provide support for or against statutes intended to protect personal and public health.

Approximately 1 million new cases of basal cell or squamous cell skin cancers are reported each year in the United States, and approximately 40,000 new cases of melanoma also are reported. These cancers are most common among individuals with lightly pigmented skin. Risk factors for skin cancer include excessive exposure to ultraviolet (UV) radiation, fair complexion, and occupational exposure to substances such as coal tar, creosote, arsenic compounds, and radium.

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## At a Glance

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## Introduction

The relationship between excessive exposure to UV light and skin cancer suggests that many cases of skin cancer could be prevented by protecting skin as much as possible when outdoors. In this activity, students consider the reasons to support or oppose a proposed federal statute that would require all individuals under the age of 18 to wear headgear and clothing that covers 90 percent of their extremities while outside during peak hours of UV exposure. Discussing the relative merits of this statute offers students the opportunity to discover that one difficulty in developing public policy is that any single policy typically advances one set of interests over another. For example, enacting the statute about mandatory protective clothing advances the value of individual and societal health and well-being at the expense of the value of personal autonomy.

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## Materials and Preparation

You will need to prepare the following materials before conducting this activity:

- Master 5.1, *A Proposed Statute* (make 1 copy per student)
- Master 5.2, *Getting Prepared to Support or Oppose the Statute* (make 1 copy per student)
- Master 5.3, *The People Respond* (make 1 copy per student)
- Master 5.4, *Reference Database* (make 1 copy per student)
- Master 5.5, *Analyzing the Results of a Public Policy Discussion* (make 1 copy per student)

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## Procedure



Science plays an important role in helping legislators make decisions about laws related to personal and public health. For example, as illustrated in this activity, science provides evidence that can be used to support or oppose laws protecting people from exposure to harmful agents. Ask students to name other examples where science has helped lawmakers act in ways that protect personal and public health (for example, mandatory vaccination programs and laws regulating toxic chemical use).

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- 1. Explain that in this activity, the students will act as elected federal legislators and members of a special committee. The committee will study the feasibility of enacting legislation to reduce the incidence of skin cancer among U.S. citizens.**

*Tip from the field test.* Another way to begin the activity is to ask the students how many think they are “open-minded” and, after they have responded, to ask them what it means to be open-minded. Use probing questions to elicit the idea that being open-minded does not mean accepting all arguments or ideas as being equally valid. It *does* mean being willing to listen to and consider arguments and ideas that are different from one’s own. After this discussion, introduce the activity as described in Step 1.

- 2. Distribute one copy of Master 5.1, *A Proposed Statute*, to each student and ask students to organize into their teams to read and discuss the statute.**

Initially, students may respond negatively to the statute. We recommend you not challenge this response directly, but answer with something like, “Okay, I hear your concerns. But before you decide, you should learn something about skin cancer and why this legislation has been proposed.”

- 3. Assign equal numbers of “pro” and “con” teams to identify reasons to support or oppose the statute. Distribute one copy each of Masters 5.2, *Getting Prepared to Support or Oppose the Statute*; 5.3, *The People***

**Respond;** and 5.4, *Reference Database*, to each student and explain that teams will have 30 minutes to study resources that will help them answer their questions about the statute and identify the key reasons to support or oppose it.

We recommend you assign teams to pro and con positions to assure a good balance of viewpoints during the upcoming hearing (Step 6). If students complain that they do not want to identify reasons to support a position they do not hold, explain that being able to understand and argue for positions other than their own is an important skill and will help them better understand their own position.

Students should read the scripts on *The People Respond* and use resources in the *Reference Database* to help them develop their lists of reasons.

Give the teams 30 minutes to complete their research. Reasons that students may identify include those in Figure 1. Emphasize that wherever possible, students should offer evidence in support of their reasons. For example, the statement that skin cancer is the most common type of cancer in the United States would be strengthened by citing statistics (available in the reference database) about the incidence of skin cancer.

4. **Direct the teams to identify their three strongest reasons in support of or against the statute and to designate a spokesperson to articulate those reasons.**

Give the teams 5 minutes to complete this task.

5. **Announce that the hearing is about to begin and explain that at the end of the hearing, the class will vote on whether to recommend the statute for enactment. Emphasize that students are not required to vote for the position they were assigned to research. Instead, students should listen carefully to the discussion and decide how they will vote based on the strength of the reasons that are presented.**
6. **Begin the hearing by inviting one team that was assigned to identify reasons in support of the statute to present its position. Then, ask a team that was assigned to oppose the statute to present its position. Follow this pattern until all teams have presented their positions, then open the floor to comments and questions raised by other students.**

Instruct students to continue filling in the table on *Getting Prepared* as each team presents its position. In this way, each student develops a list of reasons for and against the statute that he or she can compare prior to the class vote (Step 8).

If a team has no new reasons among its “strongest reasons” to add to the discussion, allow it to add other reasons that have not yet been presented.

**Figure 1 Reasons to Support or Oppose the Statute**

To Support the Statute	To Oppose the Statute
<p>Skin cancer is the most common type of cancer in the United States.</p> <p>Protection of the type described likely would reduce the incidence of UV damage that can lead to the development of skin cancer.</p> <p>The incidence of melanoma in the United States has more than doubled in 20 years.</p> <p>Skin cancer carries costs for individuals and society. Potential costs include emotional costs, costs associated with the loss of productivity, insurance costs, direct costs for treatment, and costs associated with the loss of life.</p> <p>As the ozone layer continues to deteriorate, the chance of experiencing harmful UV exposure increases. Although most types of skin cancer are easily detected and cured, melanoma is less easily detected in people with heavily pigmented skin and can lead to serious consequences and even death.</p>	<p>The statute unreasonably reduces personal freedom and may even create undue hardship.</p> <p>Although the statute applies to everyone, the risk of skin cancer is not equal for everyone.</p> <p>It is not clear who would enforce the law or what the penalties would be.</p> <p>It is not clear who is responsible for making sure that individuals under the age of 18 comply with the law.</p> <p>There are other ways to reduce the incidence of skin cancer.</p> <p>Skin cancer is easily detected and cured; the money that would be spent to enforce this statute might be better spent on widespread screening programs to detect skin cancer as early as possible.</p>

**7. When it appears that students have made all the points they are prepared to make, announce that discussion on the issue is about to close. Give students 2 minutes to organize their thoughts and ask questions about any issues that they need clarified.**

**8. Designate one corner of the classroom as the area for opponents of the statute to assemble, and another corner for proponents of the statute to assemble. Ask students to vote by taking a position in the corner that reflects their position on the statute.**

This “cornering” technique, more dramatic than voting by a show of hands, is a powerful strategy for helping students learn to take a public position on a controversial topic.

**9. Record the results of the class vote on the board.**

**10. Ask the original teams to reconvene to develop written answers to the questions on Master 5.5, *Analyzing the Results of a Public Policy Discussion*.**

Give the teams approximately 5 minutes for this task.

**11. Close the activity by inviting responses to the questions on *Analyzing the Results*.**

**Question 1 What revisions, if any, would you make to the statute in the light of the reasons you heard?**

Answers will vary. Some students may suggest that the percentage covered be reduced to make compliance less onerous and, in cases such as lifeguards, safer. Other students may suggest that certain locations, such as beaches, and certain activities, such as those that require unrestricted movement to be safe, be made exempt from the law. Still others may propose that the law apply only to people located within certain bands of latitude and/or at certain elevations.

If students have difficulty suggesting reasonable changes, you may wish to ask them questions such as “Is there any way this law could be changed to make it acceptable to you?” or “Can the statute be modified to reduce or eliminate some of its disadvantages while keeping its important benefits?”

**Question 2 What other suggestions can you make about reducing the incidence and impact of skin cancer in the United States?**

Encourage students to think creatively here and to employ all they have learned as a result of completing the activities in this module. You may wish to point out that if they are unhappy with the proposed statute, a positive approach to defeating the measure would be to propose alternate courses of action that would have equal or greater benefits at lower cost. Students may suggest aggressive educational campaigns to alert the public, including children, to the dangers of UV exposure. They also may suggest research to develop more effective sunscreens or materials for canopies at playgrounds and beaches that let warmth and light through but block harmful UV radiation. Other possible suggestions include making annual skin cancer screening mandatory for adults over a certain age, research to develop less expensive and more effective treatment for all types of skin cancer, and even more aggressive research and policy making directed at slowing or reversing the loss of the earth’s ozone layer, which is becoming an increasingly important factor in UV exposure in certain parts of the world.

**Question 3 How does this activity illustrate that**

- **good choices can reduce a person’s chance of developing cancer?**

People have many choices available to them that can significantly reduce their chances of developing skin cancer and even can increase their chances of surviving should they develop it. Some of these choices include avoiding being outdoors during hours of peak UV exposure, wearing sunscreen and protective clothing when outdoors



Look for evidence that students understand the importance of balancing the need for protection against the value of autonomy in personal decision making. Expect students to recognize that understanding the causes of cancer helps people make decisions about a variety of cancer-related activities, from prevention to reducing risk to detection and treatment.



Questions 3 and 4 on *Analyzing the Results* focus students’ attention on the activity’s major concepts.

at all, practicing regular self-examination to detect unusual changes in the skin, and seeking immediate medical care if any such changes occur.

- **values sometimes conflict in debates about laws related to personal and public health?**

This activity illustrates the tension between trying to preserve the value of personal and public health and well-being and the value of individual autonomy.

- **it is possible for people to hold different positions on a controversial topic and still participate in a reasoned discussion about it?**

Students should recognize that the requirement to research their assigned position, provide evidence to support their claims, and offer their ideas in a structured manner helped them discuss this issue in a rich and meaningful way. Some students may say that the discussion did not change how they voted, but most students should recognize that they have a much better understanding of the issues involved as a result of their participation.

**Question 4 How has research about cancer helped improve personal and public health in the United States? Answer specifically, using examples drawn from all five of the activities in this module.**

Answers will vary.

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### Potential Extensions

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Extend or enrich this activity in the following ways.

- To help students understand how complex policy making can be, suggest that they rewrite the statute in light of the class discussion. The new statute should address the growing problem of skin cancer in a meaningful and effective way, but also should be acceptable to most students in the class.
- Invite interested students to develop, implement, and analyze the results of an informal survey that determines people's understanding or attitudes about skin cancer. Different teams of students may wish to develop quite different instruments. Be sure that students follow established practice by preserving the privacy of the survey participants.

# A Proposed Statute

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## **Mandatory Use of Skin Protection for All Individuals Under the Age of 18**

Whereas it is well documented that only 15 percent of Americans regularly wear a sunscreen when they are outside, and 25 percent never wear sunscreen.

Whereas there is a direct link between the sun's ultraviolet (UV) rays and melanoma, the deadliest form of skin cancer.

Whereas there were more than 42,000 new cases of malignant melanoma diagnosed in 1999.

Whereas more than 7,000 Americans die each year from melanoma.

Whereas disruption of the earth's ozone layer by atmospheric chemical pollution may lead to rising levels of UV radiation.

Whereas 80 percent of a person's UV exposure occurs prior to age 18.

Be it enacted by the Federal Statutes that:

All individuals under the age of 18 are required to wear headgear and clothing that covers 90 percent of the extremities while outside during peak hours of UV exposure. This covering shall occur in all public locations that are currently under federal jurisdiction, including public school property, recreation sites, federal buildings, and work sites supervised by employers that are overseen by OSHA regulations.

# Getting Prepared to Support or Oppose the Statute

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Follow the steps below to develop your list of reasons to support or oppose the proposed statute.

1. Spend about 5 minutes in a brainstorming session identifying reasons to support the statute and reasons to oppose it. Fill these reasons into the table on page 5.2b.
2. Read the scripts on *The People Respond*, in which people comment on the proposed statute. What questions do these people raise? Add these issues to the table.
3. Ask yourself what additional information about UV light and skin cancer might help strengthen your position. For example, you may wish to look for evidence to support the reasons you have listed or for information that can help you answer the following questions:
  - What is skin cancer? Who is most at risk? What outcomes can people who develop skin cancer expect? What outcomes does society experience as a result of skin cancer?
  - How can people reduce or prevent dangerous exposure to UV radiation? How effective are these different methods of protection?
  - Is UV exposure really a risk factor related to skin cancer? When and where does most exposure occur? Are there other important sources of UV exposure?
  - Are there other cases where society has limited behavior for public health reasons? For example, what can we learn from the Australian experience with skin cancer? Are there other examples of limiting behavior for public health reasons? How effective are they?



**Reasons to Support or Oppose the Statute**

To Support the Statute	To Oppose the Statute

# The People Respond

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**Character: Legislator**

*Government office*

Generally, we hope people use common sense and take care of themselves because the government can't be expected to protect everybody from everything. But children, children don't use common sense because they don't have common sense. That's why the government has to pass laws to protect children: no drinking, no cigarettes, special labor laws, and kids have to go to school. Now we have this ozone layer hole giving everybody skin cancer. People have to cover up. Kids aren't going to cover up unless we make them. I am introducing a law during the next session of the legislature to require all individuals under the age of 18 to wear headgear and clothing that covers at least 90 percent of their skin while they're outside. It's for their own good.

**Character: Gardener**

*Standing beside a truck full of gardening equipment*

Excuse me, but who does this law apply to? To the kid? To his parents? To his boss? 'Cause I'm the boss. If I hire a kid to mow lawns—for very good hourly wages, mind you—do I have to supply the cover-up clothes? Do I have to make sure the kid wears them? Do I get fined or does the kid get fined? If I have to watch and make sure these kids keep their hats on, the cheap labor will not be worth it.

**Character: Lifeguard**

*Sitting in a lifeguard chair at the beach*

There have to be exceptions. I can't be a lifeguard if I have to wear coveralls. I mean, what do I do, undress when I have to save someone? The person would drown. And what about me? I'll be hot. And nobody will get to see me in a bathing suit. How am I supposed to get a tan?

**Character: School Board Representative**

*School office*

I commend the representative for this bill. But I would ask where the responsibility for enforcement will lie. I hope it will rest in the home. The school, and the entire school district, have been asked to assume too many parental responsibilities. Our teachers can't use their valuable time checking to see if somebody is engaging in unsafe sunning. And what, may I ask, about students who can't afford cover-ups? Will the school be required to purchase them? This is a complicated and potentially very expensive problem.

**Character: Dermatologist**

*Dermatologist's office*

The incidence of both melanoma and nonmelanoma skin cancer has increased dramatically in the past two decades, probably because of our modern obsession with suntanning. The correlation between most skin cancer and sun exposure has been established for years. The people with the highest risk are the ones with

fair skin, blue eyes, light hair, lots of moles—in other words, the ones who burn easily and don't tan. Incidence of nonmelanoma skin cancers is greatest in people with a lot of regular sun exposure, like farmers or sailors. On the other hand, incidence of melanomas is greater for people who work indoors. The leading explanation is that occasional intense exposure is the cause—like the burn an office worker might get during vacation. I urge my patients to do self-exams and to have regular physicals so that we catch the disease early so we can cure it.

**Character: Insurance Company Representative**

*Insurance office*

We have to start to contain our skyrocketing health care costs. The insurance companies are very concerned about saving the consumer money. Sure, we could offer lower rates to fully dressed people, but isn't it easier if it's the law? People might be frustrated at first, but then they'll start to like it, just like they did when wearing seat belts became law. If we can eliminate a few thousand cases of skin cancer by making kids cover up, we'll have the resources to deal with other pressing health issues that can't be prevented. Then, if this law is successful, we can legislate against other unhealthy behavior, like smoking.

**Character: High School Track Star**

*The track*

This law can't apply to me. I'm trying to break an outdoor record. I can't do that in cover-ups. My muscles can't be bunched up and confined; they must be free. And the heat and the weight of all those extra clothes. And the wind resistance. Even a hat makes extra wind resistance. I know a guy who lost a race 'cause his headband caught the air and slowed him down. Really.

**Character: Tanning Buff**

*By an outside pool*

What's important to you? Your car? Your music? Your friends? Well, my tan is important to me. It tells me who I am. I work hard on it, and people say, "Nice tan," and I feel good. I know it's a small thing, but it's my self-esteem. I need this tan, and nobody has the right to take it away from me. And you know what? If they make it illegal for me to get to the beach, I'll go to a tanning booth. They're not illegal yet.

**Character: Person with Dark Skin**

*At a bus stop*

This law is too broad. I don't tan and I don't burn; I am immune to it. So, why should I have to drape myself in all kinds of ridiculous extra clothing? Make a law for the pale people. Leave my people alone.

**Character: Pediatrician***Doctor's office*

We think that children are immune to cancer, that it's an old person's disease. Well, childhood is where it starts. Sunburn at an early age increases the incidence of skin cancer—the more frequent and earlier the sunburn, the more likely the chance of skin cancer. Personally, I would like to make sure that this law has teeth and that it specifically targets students in public schools where they can be taught and controlled. Parents don't know what their kids are up to. The teachers are better educated and more likely to consistently protect the kids.

**Character: Fashion Historian***Academic office*

The Western standard of beauty hasn't always been the even tan. Historically, pale skin was the standard. Pale skin meant you had others to do your work, tend your fields. It meant wealth. And because the wealthy people were setting the standard, it also meant beauty. Rich people who didn't have pale skin lightened it with powder or other make-up. This same set of values appeared throughout the world, wherever there were pale people, from the Mediterranean to the Far East. Dark skin became a sign of inferiority, which figured into slavery and racism in the New World. Now, of course, dark skin, a tan, is the sign of the leisurely life. Now we have the white people flocking to the beaches or the tanning salons to darken their skin, some even painting on artificial tans. A pale skin means you're some kind of peasant working in the basement . . .

**Character: Motorcycle Rider***Parking lot, next to a motorcycle*

I don't wear a helmet because it's the law; I wear it because I don't want to get hurt if I fall. I ride my bike because it's a great way to get to work; other people ride because it's their personal self-expression. They don't want to wear a helmet, and I don't think they should have to. Same with sunscreen and big-brimmed hats. If that's how somebody wants to dress, fine. But don't force people.

# Reference Database

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## **Skin Cancer—Australian Experience**

The incidence of skin cancer is higher in Australia than in any other country, and incidence rates are still rising. In response to this problem, Australian officials adopted a variety of initiatives.

Many of these initiatives focused on public education. For example, the “SunSmart” education program, implemented from 1988 through 1990, significantly increased the use of sunscreen and hats among a test group of more than 4,000 adults. Women, particularly adolescents and young adults, developed positive attitudes about protection and behavior. Similarly, the public service announcement “Slip! Slop! Slap!” (that is, slip on a shirt, slop on sunscreen, and slap on a hat) raised awareness of skin cancer, especially among outdoor workers. Responding to the need to promote sun-safe attitudes, Australian fashion magazines have started to feature hats and use fewer models with tans.

Other educational programs have emphasized the need for regular self-examination and have encouraged physicians to routinely perform skin examinations on all patients they see.

Community changes have been important components of skin cancer prevention programs in Australia as well. These changes include building awnings and other structures to provide shade wherever possible, rescheduling sports and other outdoor community events away from midday hours to avoid peak ultraviolet light exposure periods, and reducing taxes on sunscreens.

The Australian government has promoted research on health risks associated with skin cancer. It also has encouraged organizations and communities to establish screening programs to reach individuals who are at particularly high risk for skin cancer.

## **Skin Cancer—Deaths**

The American Cancer Society estimates that approximately 9,000 Americans die each year from skin cancer. About 7,000 of these deaths are from melanoma; the other deaths are related to other types of skin cancer.

The U.S. Centers for Disease Control and Prevention (CDC) reported that from 1973 to 1992, the death rate for melanoma increased 48 percent in U.S. men. And in 1996, the CDC reported that the rate was continuing to rise, despite how easily the disease can be prevented or treated (if detected early). One explanation for this trend is increased recreational exposure to the sun.

## **Skin Cancer—Definition**

Skin cancer is a disease in which cancerous cells grow in the outer layers of a person’s skin.

Skin cancer is the most common type of cancer in the United States. In fact, an estimated 2 in every 5 Americans who reach the age of 65 will develop skin cancer sometime in their lives.

Skin cancer is the most curable form of cancer: almost 100 percent if it is caught early. Treatment involves removing or destroying the tumor completely, while causing minimal damage to surrounding tissues.

Skin cancer also is one of the most preventable cancers. Some scientists have estimated that 90-95 percent of all cases result from overexposure to the sun and might have been avoided if the patients had practiced appropriate protective measures.

### **Skin Cancer—Detection**

The cure rate for skin cancer could be 100 percent if all skin cancers were brought to a doctor's attention before they had a chance to spread. Therefore, people should check themselves regularly for new growths or other changes in the skin. Any new, colored growths or any changes in growths that are already present should be reported to a doctor without delay.

Doctors also should look at the skin during routine physical exams. People who have already had skin cancer should be sure to have regular exams so that the doctor can check the skin, both the treated areas and other places where cancer may develop.

### **Skin Cancer—Diagnosis**

Most skin cancer is diagnosed and treated in the same way. When an area of skin does not look normal, the doctor may remove all or part of the growth. This is called a biopsy. To check for cancer cells, the tissue is examined under a microscope by a pathologist or a dermatologist. A biopsy is the only sure way to tell if the problem is cancer.

Doctors generally divide skin cancer into two stages: local (affecting only the skin) or metastatic (spreading beyond the skin). Because skin cancer rarely spreads, a biopsy often is the only test needed to determine the stage. In cases where the growth is very large or has been present for a long time, the doctor will carefully check the lymph nodes in the area. In addition, the patient may need to have additional tests, such as special X-rays, to find out whether the cancer has spread to other parts of the body. Knowing the stage of a skin cancer helps the doctor plan the best treatment.

### **Skin Cancer—Incidence**

Skin cancer is the most common type of cancer in the United States, making up approximately one-half of all types of localized cancer. According to current estimates, 40–50 percent of Americans who live to age 65 will have skin cancer at least once.

The American Cancer Society estimates that in 1998 there were approximately 1 million new cases of highly curable basal cell or squamous cell skin cancers. The society also estimates that in 1998 more than 40,000 new cases of melanoma, the most serious form of skin cancer, were diagnosed. The incidence of melanoma is approximately 20 times higher among Caucasians than among African Americans.

### **Skin Cancer—Prevention (Personal Actions)**

The best defense against skin cancer is protection from the sun and ultraviolet light.

The National Cancer Institute recommends that whenever possible, people should avoid exposure to the midday sun (from 10 a.m. to 2 p.m. standard time, or from 11 a.m. to 3 p.m. daylight saving time).

People should remember that protective clothing, such as sun hats and long sleeves, can block out the sun's harmful rays. Also, lotions that contain sunscreen with an SPF of 15 or higher can protect the skin.

The American Cancer Society notes that there is a link between severe sunburns in childhood and significantly increased risk of developing melanoma later in life. Therefore, children especially should be protected from the sun. In fact, programs promoting behavioral change have begun in U.S. schools and at beaches and pools. Some programs try to reach children with simple messages. For example, the "shadow rule" ("Short shadow! Seek shade!") teaches children that when their shadows are shorter than they are, it is time to seek shade and use sunscreen and hats. Other awareness programs are directed at parents and caregivers.

Additional prevention tips from the American Academy of Dermatologists include:

- When in the sun, wear a wide-brimmed hat that shades the face, neck, and ears; sunglasses that block UVA and UVB rays; and protective clothing (long-sleeved shirts, long pants). Dark, tightly woven clothes filter out the sun best.
- Practice protection from the sun even when it is cloudy. As much as 80 percent of the sun's rays can penetrate light clouds, mist, and fog.
- Be especially careful near reflective surfaces such as sand, concrete, water, or snow. These surfaces can reflect up to 85 percent of the sun's rays.
- Use a sunscreen with a higher SPF than usually used if visiting an area with high altitudes or a tropical climate; sunlight in these areas is particularly intense.
- Keep infants younger than 6 months out of direct sunlight. After 6 months of age, begin using a sunscreen made especially for an infant's sensitive skin. Be sure infants wear hats when they are in the sun.

### **Skin Cancer—Prevention (Societal Actions)**

Many organizations, including the National Cancer Institute, the American Cancer Society, and the American Academy of Dermatologists (AAD) distribute educational programs that alert the public to risk factors associated with skin cancer and ways to detect and prevent the disease. For example, in 1998 the Centers for Disease Control and Prevention (CDC) launched "Choose Your Cover," the federal government's first national sun protection initiative. The five-year program will use media announcements to influence the public's perceptions about sun protection and suntanning. The initiative's ultimate goal is to increase people's willingness and tendency to practice sun-safe behaviors.

Many organizations also produce materials that encourage health care professionals to regularly examine their patients' skin for signs of cancer and improve their ability to detect it at an early stage. Currently, only an estimated 14–25 percent of melanoma is discovered by a physician prior to the patient noticing something wrong.

Some organizations offer free skin examinations by dermatologists. One program sponsored by AAD provided free screening to almost 750,000 Americans between 1985 and 1994. These programs have shown some success. For example, of 195,660 people screened from 1992 to 1993, at least 261 cases of melanoma were confirmed in 257 individuals. Based on comments from these people, an estimated 36 percent of those with confirmed cases would not have seen a physician if the screening had not been available.

To promote public awareness of the hazards of ultraviolet light, the United States Weather Service, the Environmental Protection Agency, and the CDC publicize the UV index in television and newspaper weather reports in more than 50 major cities across the nation. This index rates predicted UV intensity on a scale of 1 to 10+ and suggests appropriate protective measures.

### **Skin Cancer—Prognosis (Likely Outcomes)**

Skin cancer has a better prognosis, or likely outcome, than most other types of cancer. Although skin cancer is the most common type of cancer in this country, it accounts for less than 1 percent of all cancer deaths.

When diagnosed at a stage at which it is still localized, the five-year relative survival rate for all types of skin cancer is 94 percent. Seventy-four percent of all skin cancers are diagnosed at this stage. For skin cancers that are not localized, five-year relative survival rates drop significantly (to 49 percent if the cancer has spread regionally and 6 percent if the cancer has spread to distant sites).

### **Skin Cancer—Public Awareness**

A study released in 1996 by the U.S. Centers for Disease Control and Prevention and the American Academy of Dermatology indicates that 42 percent of the adults surveyed had no knowledge of melanoma, the deadliest form of skin cancer. The level of awareness was lowest among people ages 18 to 24 years.

The survey also found that awareness of melanoma is related to income. Of people with annual incomes of less than \$20,000, 60 percent reported that they did not recognize the term “melanoma.” Only 31 percent of people with annual incomes of \$75,000 or more reported no knowledge of the disease.

### **Skin Cancer—Risk Factors**

The most important risk factors for developing skin cancer are excessive exposure to ultraviolet (UV) light, fair complexion, occupational exposure to radium or certain chemicals (for example, arsenic compounds), and family history.

Although anyone can get skin cancer, the risk is greatest for people who have fair skin that freckles easily—often those people with red or blond hair and blue or light-colored eyes.

UV radiation from the sun is the main cause of skin cancer. In particular, childhood sunburns are linked to an increased later risk of melanoma. Some experts estimate that one blistering sunburn will double a person’s chance of developing skin cancer.



Artificial sources of UV radiation, such as sun lamps and tanning booths, also can cause skin cancer. Contrary to some people's beliefs, suntan is not a protective measure against skin cancer. In fact, tanning is evidence of the same damage occurring in skin cells that causes sunburn. Tanning also is associated with irreversible skin damage (such as early aging).

The chance of developing skin cancer is related to lifetime exposure to UV radiation. People who live in areas that get high levels of UV radiation from the sun are more likely to get skin cancer than people who live in other areas. In the United States, skin cancer is more common in Texas than it is in Minnesota, where the sun is not as strong. Worldwide, the highest rates of skin cancer are found in South Africa and Australia, areas that receive high amounts of UV radiation.

Elevation (or altitude) also affects UV exposure. Generally, UV exposure is greater at higher elevations (for example, in the mountains) than at lower elevations. Skiing carries a particular risk of significant UV exposure because of the high elevation and the great exposure to sunlight, both direct and reflected from the snow.

Because the chance of developing skin cancer is related to lifetime exposure to UV radiation, protection should start in childhood to prevent skin cancer later in life. Most skin cancers appear after age 50, but the sun's damaging effects begin at an early age.

Even though most skin cancers are cured, the disease can recur in the same place. Also, people who have been treated for skin cancer have a higher-than-average risk of developing a new cancer elsewhere on the skin. That is why it is so important for them to continue to examine themselves regularly, to visit their doctor for regular check-ups, and to follow the doctor's instructions on how to reduce the risk of developing skin cancer again.

### **Skin Cancer—Self-Examination**

People can improve their chances of finding skin cancer promptly by regularly performing a simple skin self-exam. The best time to do this is after a shower or bath. The best way to examine one's skin is in a well-lighted room using a full-length mirror and a hand-held mirror. Begin by learning where normal birthmarks, moles, and blemishes are and what they usually look like. People also should check for anything new: a change in the size, texture, or color of a mole, or a sore that has not healed.

It is important to check all areas, including the back, scalp, between the buttocks, and genital area.

### **Skin Cancer—Symptoms**

The most common warning sign of skin cancer is a change on the skin, especially a new growth or a sore that doesn't heal. Skin cancers don't all look the same. For example, the cancer may start as a small, smooth, shiny, pale, or waxy lump. Or it can appear as a firm, red lump. Sometimes, the lump bleeds or develops a crust. Skin cancer can also start as a flat, red spot that is rough, dry, or scaly.

Both basal and squamous cell cancers are found mainly on areas of the skin that are exposed to the sun: the head, face, neck, hands, and arms. However, skin cancer can occur anywhere.

Actinic keratosis, which appears as rough, red or brown, scaly patches on the skin, is known as a precancerous condition because it sometimes develops into squamous cell cancer. Like skin cancer, it usually appears on sun-exposed areas, but can be found elsewhere.

Changes in the skin are not sure signs of cancer; however, it is important to see a doctor if any symptom lasts longer than 2 weeks. People should not wait for an area to hurt—skin cancers seldom cause pain.

### **Skin Cancer—Treatment**

A doctor's main goal in treating skin cancer is to remove or destroy the cancer completely with as small a scar as possible. To plan the best treatment for each patient, the doctor considers the location and size of the cancer, the risk of scarring, and the person's age, general health, and medical history.

Treatment for skin cancer usually involves some type of surgery. In some cases, doctors suggest radiation therapy or chemotherapy. Sometimes, a combination of these methods is used. Many skin cancers can be cut from the skin quickly and easily. In fact, the cancer is sometimes completely removed at the time of the biopsy, and no further treatment is needed.

Doctors commonly use a type of surgery called curettage. After a local anesthetic numbs the area, the cancer is scooped out with a curette, an instrument with a sharp, spoon-shaped end. The area is also treated by electrodesiccation. An electric current from a special machine may be used to control bleeding and kill any cancer cells remaining around the edge of the wound. Most patients develop a flat, white scar.

### **Skin Cancer—Types**

There are several types of skin cancer. The most common types are basal cell cancer and squamous cell cancer. These types of skin cancer are called nonmelanoma skin cancer.

Melanoma is a type of skin cancer that is less common than basal cell or squamous cell cancer, but is more serious.

#### **Basal Cell Cancer**

Basal cell carcinoma accounts for more than 90 percent of all skin cancers in the United States. It is a slow-growing cancer that seldom spreads to other parts of the body.

Basal cell cancer usually occurs on areas of a person's skin that have been exposed to the sun. Often, it appears as a small, raised bump that has a smooth, pearly appearance. However, it can also look like a scar and seem firm to the touch.

#### **Squamous Cell Cancer**

Squamous cell cancer usually occurs on parts of a person's body that have been exposed to the sun. Often, it appears on the top of the nose, forehead, lower lip, and back of the hands. It also may appear on skin that has been severely sunburned, been exposed to carcinogenic chemicals, or had X-ray therapy.

Squamous cell cancer often appears as a firm, red bump; sometimes it may feel scaly or bleed or develop a crust. Squamous cell cancer rarely spreads, but it does so more often than basal cell cancer. Squamous cell cancer may spread to nearby lymph nodes.

### **Melanoma**

Melanoma is the most serious cancer of the skin. In some parts of the world, especially among Western countries, the number of people who develop melanoma is increasing faster than the number for any other cancer. In the United States, the incidence of melanoma has more than doubled in the past 20 years. One explanation for this trend is increased recreational exposure to the sun.

Melanoma begins in certain cells in the skin called melanocytes. Melanocytes are spread throughout the lower part of the epidermis. They produce melanin, the pigment that gives our skin its natural color. When skin is exposed to the sun, melanocytes produce more pigment, causing the skin to tan, or darken.

Melanoma occurs when melanocytes become malignant. Most melanocytes are in the skin; when melanoma starts in the skin, the disease is called cutaneous melanoma. Melanoma may also occur in the eye and is called ocular melanoma or intraocular melanoma. Rarely, melanoma may arise in the meninges, digestive tract, lymph nodes, or other areas where melanocytes are found.

Melanoma can occur on any skin surface. In men, it is often found on the trunk (the area from the shoulders to the hips) or the head and neck. In women, it often develops on the lower legs. Melanoma is rare in African-American people and others with dark skin. When it does develop in dark-skinned people, it tends to occur under the fingernails or toenails or on the palms or soles. The chance of developing melanoma increases with age, but this disease affects people of all age groups. Melanoma is one of the most common cancers in young adults.

When melanoma spreads, cancer cells are found in the lymph nodes. If the cancer has reached the lymph nodes, it may mean that cancer cells have spread to other parts of the body, such as the liver, lungs, or brain. In such cases, the disease is called metastatic melanoma.

More than 90 percent of melanomas that arise in the skin can be recognized with the naked eye. Very often, the tumor first grows horizontally beneath the skin surface, but does not grow vertically, down into underlying tissues. This period of horizontal growth offers patients lead time for detecting the cancer early. Melanoma that has not yet spread vertically is completely curable.

# Analyzing the Results of a Public Policy Discussion

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Answer the following questions related to the public policy discussion you just completed.

1. What revisions, if any, would you make to the statute in the light of the reasons you heard?
  
  
  
  
  
  
  
  
  
  
2. What other suggestions can you make about reducing the incidence and impact of skin cancer in the United States?
  
  
  
  
  
  
  
  
  
  
3. How does this activity illustrate that
  - good choices can reduce a person's chance of developing cancer?
  
  
  
  
  
  
  
  - values sometimes conflict in debates about laws related to personal and public health?
  
  
  
  
  
  
  
  - it is possible for people to hold different positions on a controversial topic and still participate in a reasoned discussion about it?
  
  
  
  
  
  
  
4. How has research about cancer helped improve personal and public health in the United States?  
Answer specifically, using examples drawn from all five of the activities in this module.